devatec

TECHNICAL HANDBOOK

ELECTRODE STEAM HUMIDIFIER



ElectroVap KIT MC

Contents

IMPORTANT

Please read, heed and follow the enclosed safety information and the warning labels inside the humidifier before installation or maintenance.

Warnings & safety symbols



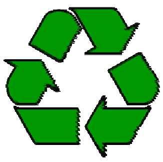
Warning : This symbol is used to designate a danger of injury or potential damage to the system.



Caution : High voltages are present inside the humidifier. All works concerned with the electrical installation must be carried out by skilled and qualified personnel.



Caution : Danger of scalding ! The ElectroVap KIT MC generates steam during operation and therefore surfaces and pipe-work become very hot. Ensure that equipment not sustaining high temperatures be kept away.



Warning : the end user should ensure that the equipment be disposed of according to the local prevailing regulations.

Delivery and storage

Any loss or damage during delivery should be reported to carrier by registered letter within 3 working days and be advised to **devatec** or to authorized dealer.

It is recommended that the ElectroVap KIT MC humidifier be kept in its transit packaging for as long as possible prior to maintenance. If the humidifier is to be put into storage prior to installation, it must be stored under cover and protected from physical damage, dust, frost, rain and humidity. More than 6 months storage is not recommended.

GENERAL

This manual contains all details necessary for the planning and installation of the ElectroVap KIT MC humidifier. In addition commissioning and maintenance details are included.
The manual is intended for use by engineers and properly trained technical personnel. Maintenance, servicing or repair work must only be carried out by suitable skilled and qualified personnel, the customer must be responsible for ensuring their suitability.
Any risks or hazards, especially when working from ladders or towers should be identified by a skilled and Health and Safety representative and effective control measure put in place.
No liability will attach to the Distributor if any damage, injury or accident is attributable to inattentive, inappropriate, negligent or incorrect operation of the machinery whether or not caused deliberately. Always isolate all electrical and water supplies before commencing any maintenance.
Every effort has been made to ensure details contained in this manual are correct, however, in view of the wide range of conditions experienced in air handling systems, the information provided should only be used as a guide. Please contact your Agent if any doubt.

Correct use

ElectroVap MC2 humidifiers are ONLY intended for use with air handling systems or direct air humidification. ANY OTHER APPLICATION IS NOT CONSIDERED USE FOR THE INTENDED PURPOSE. THE MANUFACTURER CANNOT BE MADE LIABLE FOR ANY DAMAGE RESULTING FROM INCORRECT USE.

Water

ElectroVap KIT MC humidifiers are designed to be used with mains, demineralized R/O or softened water. On no account attempt to introduce any other fluid or chemical into the system. Water supply should not exceed 6.0 bar and installation should comply with local regulations.

Electricity

All work concerned with electrical installation MUST only be performed by skilled and qualified technical personnel (eg electrician or technicians with appropriate training). The customer MUST be responsible for ensuring their suitability.
It is the duty of the installer to ensure that suitable sized cables and MCB protection is provided. Please observe the local regulations concerning the provision of electrical installations.

Warranty

A two year warranty term—cost and labor—is applicable to the parts of the ElectroVap KIT MC to the exception of the consumable parts (valves, cylinders or parts of cylinders) provided our recommendations of use & maintenance have been adhered to. Failure to specify and fit original parts and accessories will invalidate our warranty.

NOTE

The manufacturer's policy is one of continuous research and development. He therefore reserves the right to amend without notice the specifications given in this document.

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ELECTROVAP KIT MC

Product accreditation

CE *APPLIED DIRECTIVES*

Electromagnetic Compatibility Directive :	**89/336/EEC, 2004/108/EC**
Low Voltage Directive :	**73/23/EEC, 2006/95/EC**
Machinery Directive :	**98/37/EC Amending Directive 89/392/EEC**

Standard(s) to which Conformity is declared :

EN 61000-6-3 : Electromagnetic compatibility generic requirements (residential, commercial and light industries)

EN 55022 class B conducted and radiated emission limits)

EN 61000-6-2 : Electromagnetic compatibility (EMC) – Generic standards –Immunity for industrial environments;

EN 61000-4-3 : Radiated, radio frequency, electromagnetic field immunity test.
EN 61000-4-6 : Immunity to conducted disturbances induced by radio frequency fields
EN 61000-4-4 : Electrical fast transient/burnt immunity test
EN 61000-4-5 : Surge immunity test
EN 61000-4-2 : Electrostatic discharge immunity test

EN 60204-1 : Safety of machinery – Electrical Equipment of machines – Part 1 : General requirements

EN 292 Parts 1 & 2 : Safety of machinery basic principle mechanical design.

Manufacturer's Name and Address

DEVATEC SAS
Rue Saint Eloi
76550 Ambrumesnil - FRANCE

Authorised Representative

Type of equipment

STEAM HUMIDIFIER

Model Name (s) & Series:

ELECTROVAP MC / KIT MC

Year of Manufacture

2001

We the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

Mr FRAMBOT Jean-François
Managing Director
Date : 02.07.2007

ELECTROVAP KIT MC
RoHS declaration

devatec sas
Rue Feu St Eloi
76550 Ambrumesnil
France

Confirms that the ElectroVap KIT MC steam humidifier is manufactured in compliance with
the European regulations 2002/95/EU (RoHS).

This guideline regulates after July 1st 2006 the use of mercury, cadmium, lead (soldering
processes), chrome VI as well as PBB and PBDE. ELMC steam humidifiers manufactured
previously to this date may contain above materials.

Name : MINFRAY Jean-Marie
Position : R&D Engineer
Date : 05.06.2008

Signature: 

ELECTROVAP KIT MC
Delivery contents

Any loss or damage during delivery should be reported to carrier by registered letter within 3 working days and be advised to **devatec** or to authorized dealer.

It is recommended that the ElectroVap KIT MC humidifier be kept in its transit packaging for as long as possible prior to maintenance. If the humidifier is to be put into storage prior to installation, it must be stored under cover and protected from physical damage, dust, frost, rain and humidity. More than 6 months storage is not recommended.

What is in the box :

1. One steam humidifier in on/off or proportional control , one disposable or cleanable cylinder (for KIT MC 5 to 30), 2 cylindres (for KIT MC 40 to 60), and one technical brochure.

2. One special command board (ref: 500101/05).

3. Hose clamps :
   KIT MC 5 to 30 : 2 clamps for the steam hose
   KIT MC 40 to 60: 4 clamps for the steam hoses



KIT MC 5 to 30



KIT MC 40 to 60



Board 500101/05

OPTIONS

4. Water hose kit (part nb 100050902) including 1m. long Ø 25mm drain, one clamp and one hose with 3/4” thread (with washers) for tap water connection.

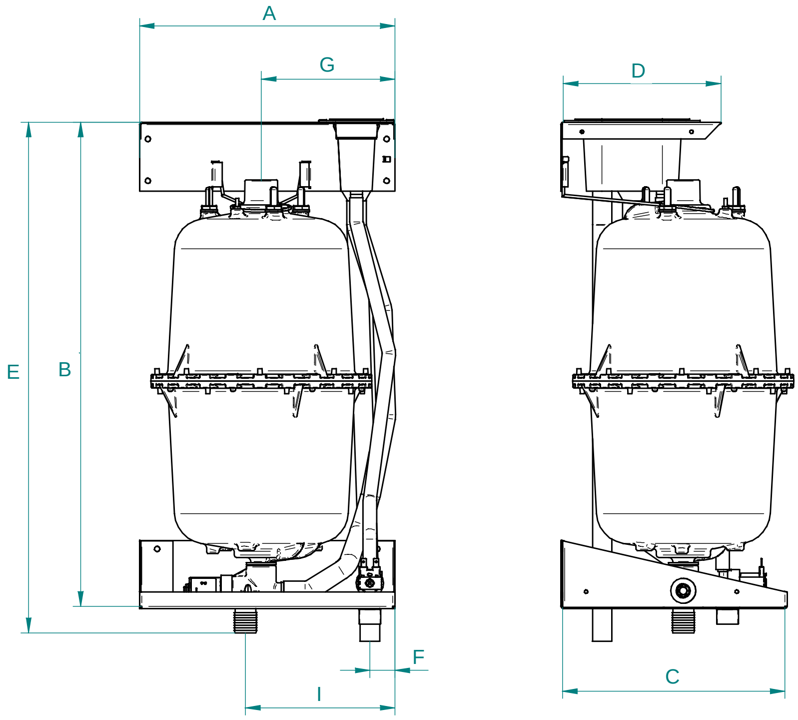


5. Electrical kit (part nb 10005903) including one on/off rock switch and 1 m. long valve electrical cables.

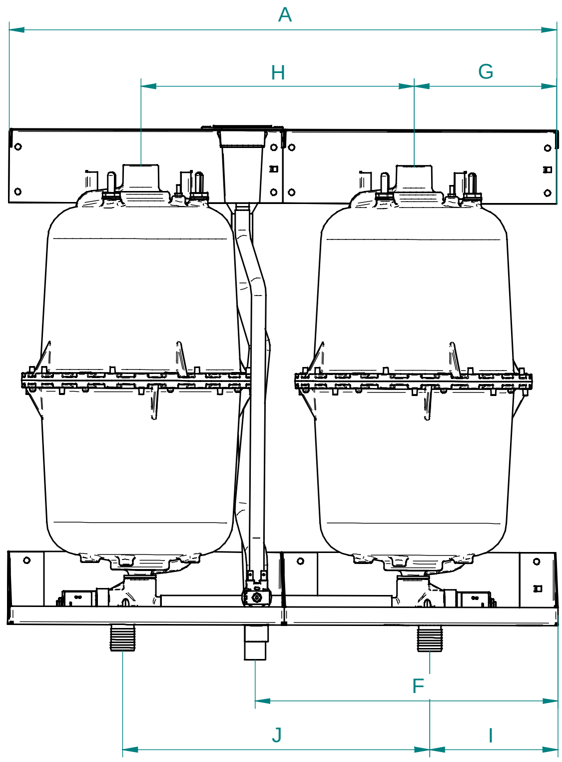
ELECTROVAP KIT MC

Dimensions & Weight

KIT MC 5 to 30

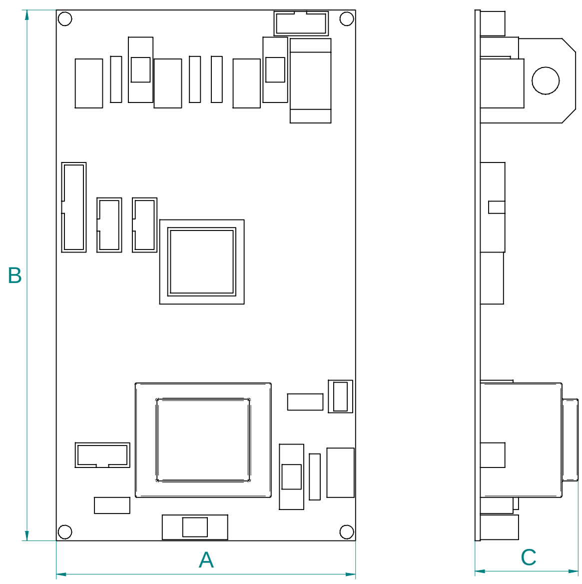


KIT MC 40 to 60

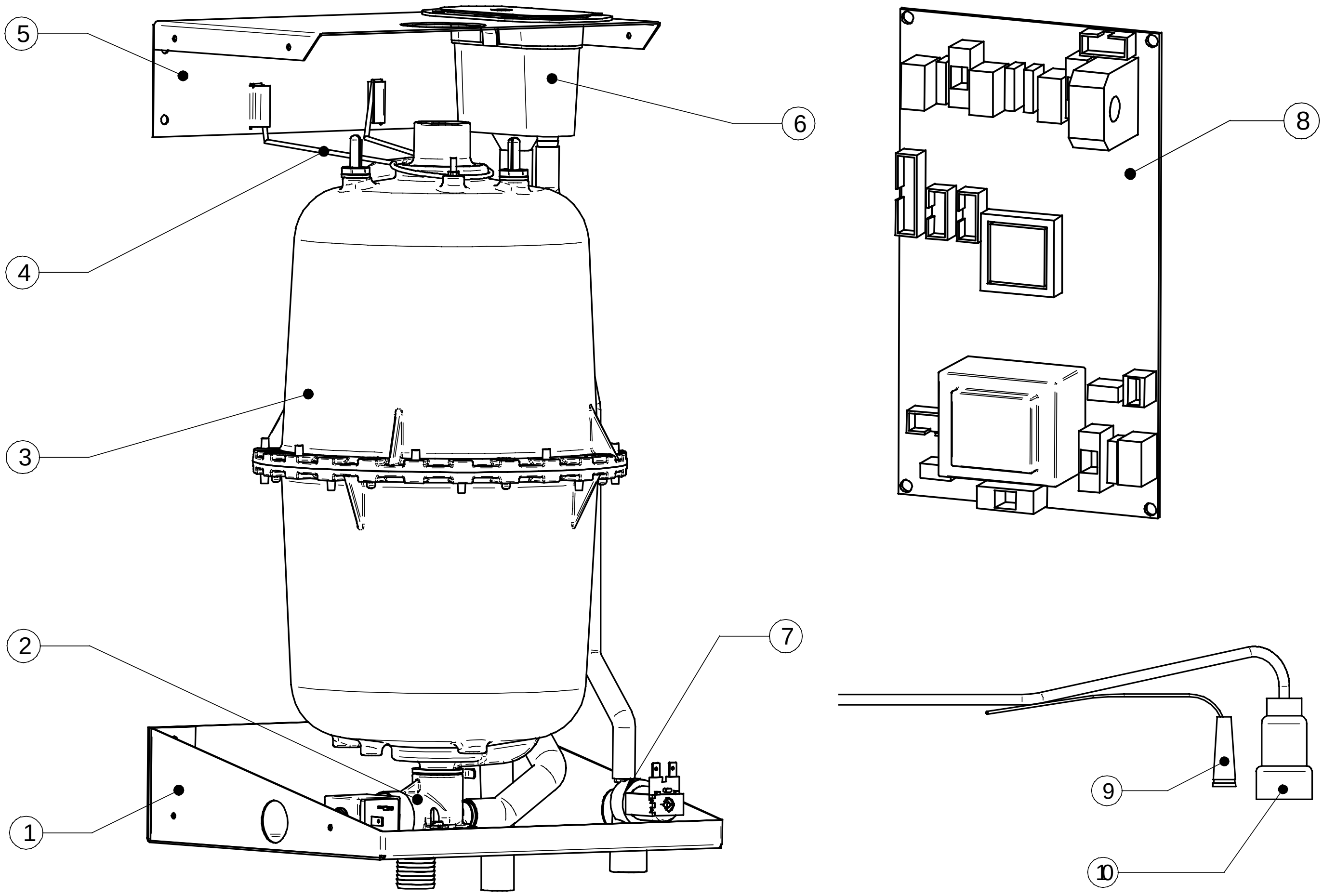


	Dimensions in mm										Weight in Kg	
	Humidifier					Water inlet	Steam outlet	Steam outlet spacing	Drain outlet	Drain outlet spacing	Empty	Opera -ting
Model	A	B	C	D	E	F	G	H	I	J		
KIT MC 5 to 15-2	305	453	270	191	480	30	146		178,5		7	9
KIT MC 20 to 30	305	605	270	191	632	30	146		178,5		9	12
KIT MC 40 to 60	710	605	270	191	632	30	146	305	141,5	345	18	23

	Electronics			Weight in Kg
Ref: 500101/05	110	195	35	0,6



Example : KIT MC 5 to 30



1	Bracket (lower)
2	Drain valve
3	Steam cylinder
4	Cylinder holding spring
5	Bracket (upper)
6	Filling cup
7	Inlet valve
8	Main electronic board (Ref: 500101/05-1TI)
9	High water level electrode wire
10	Power electrode wire (x3)

How to install the humidifier on wall

The humidifier should be operated within 5°C and 40°C in a room with less than 80% of humidity.

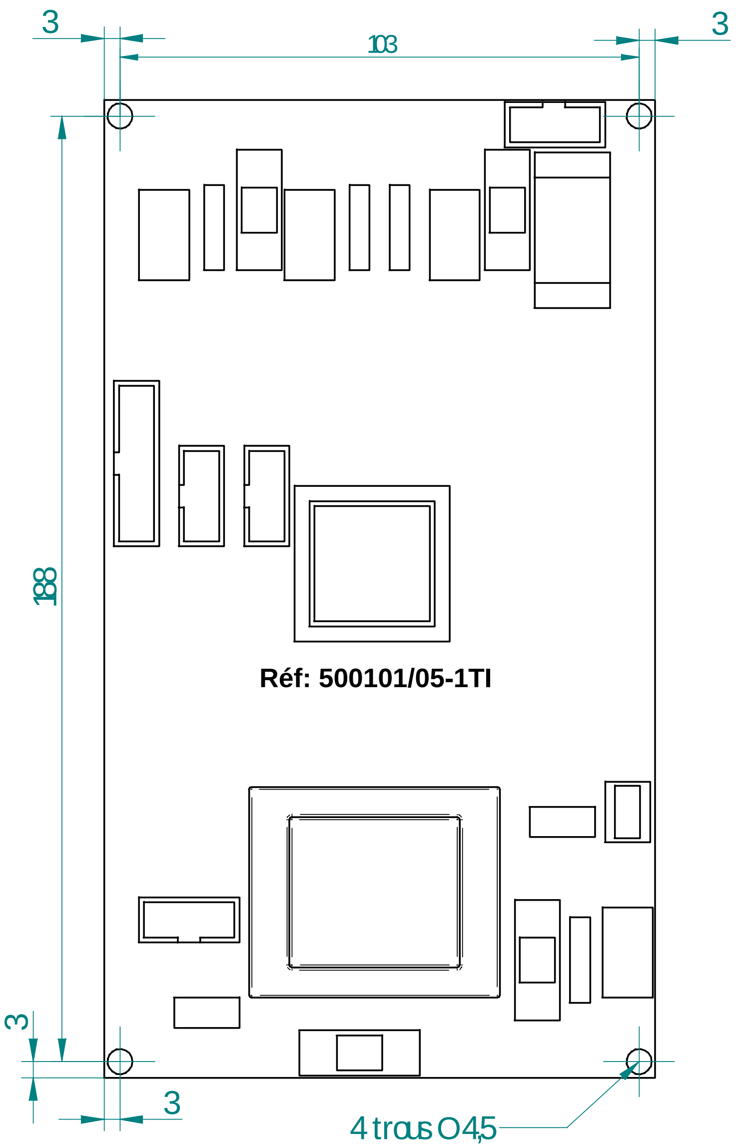
When in operation, the rear panel becomes hot (60°C) so do not hang the humidifier on a heat sensitive surface.

The **devatec** humidifiers have been developped to be hanged on wall. Before installation, make sure that the surface material is strong enough to hold the humidifier.

The best performances of the humidifier are achieved when the steam discharge is made at short distance from the humidifier.

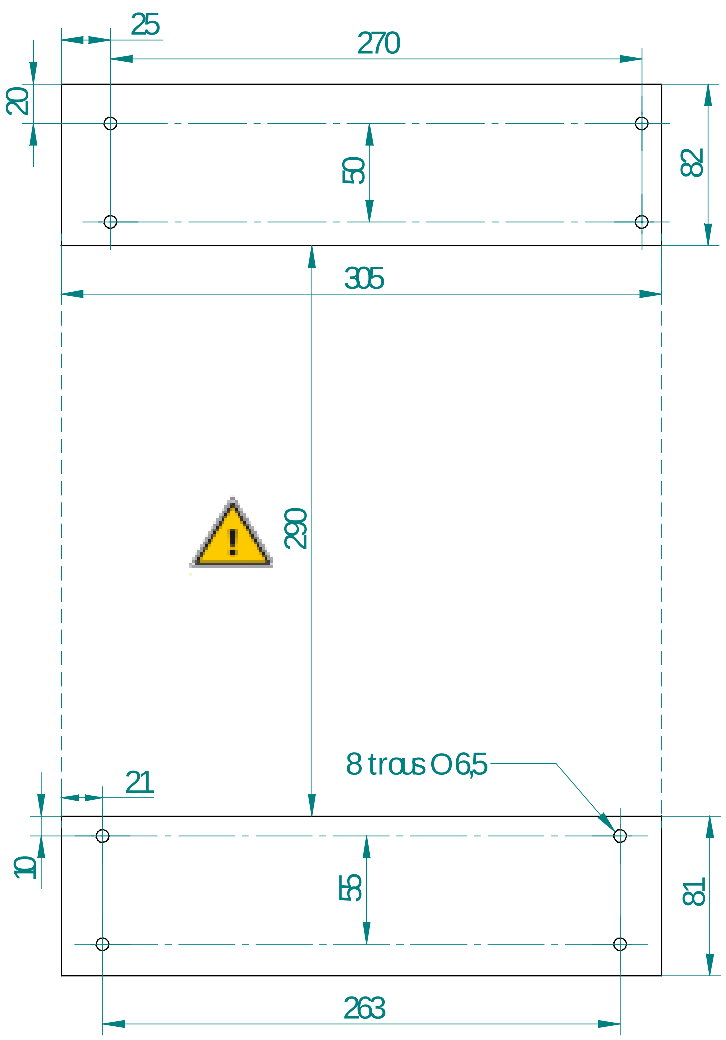
On wall :

Dimensions for wall mounting

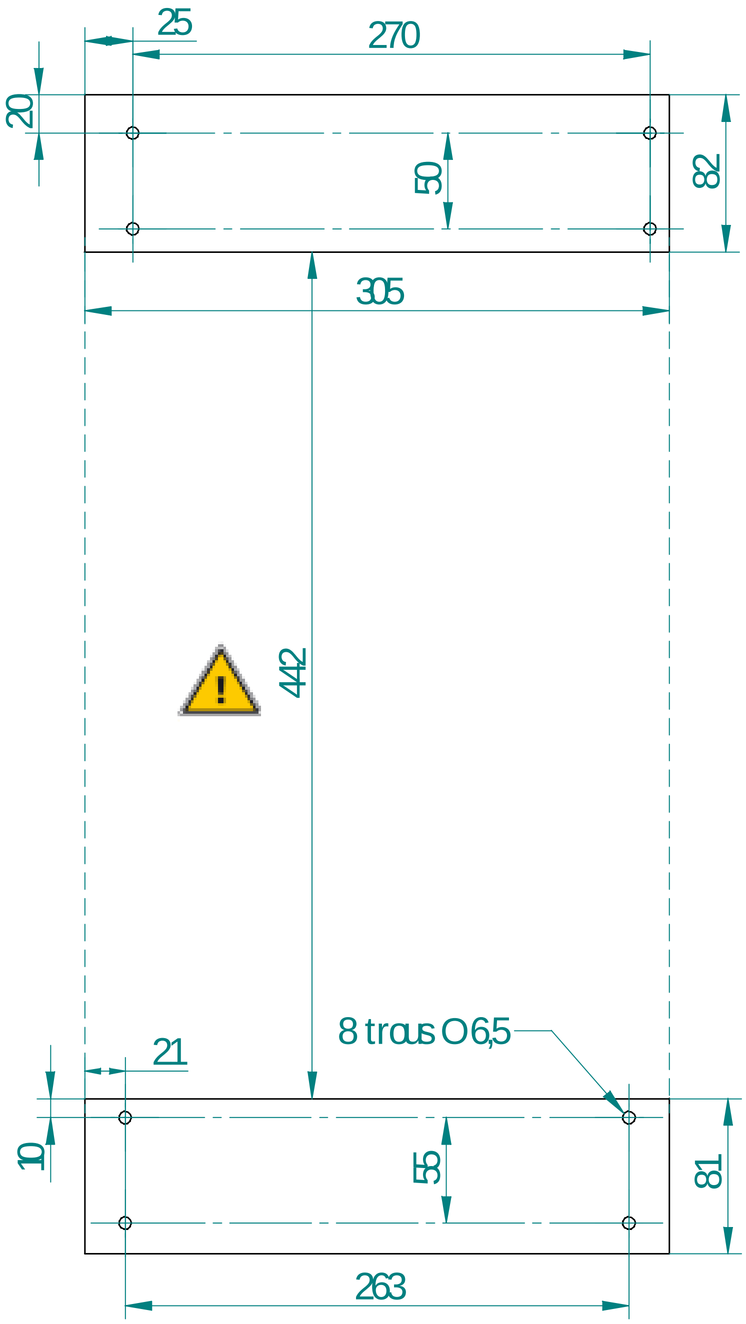


Dimensions for wall bracket mounting

KIT MC 5 to 15-2



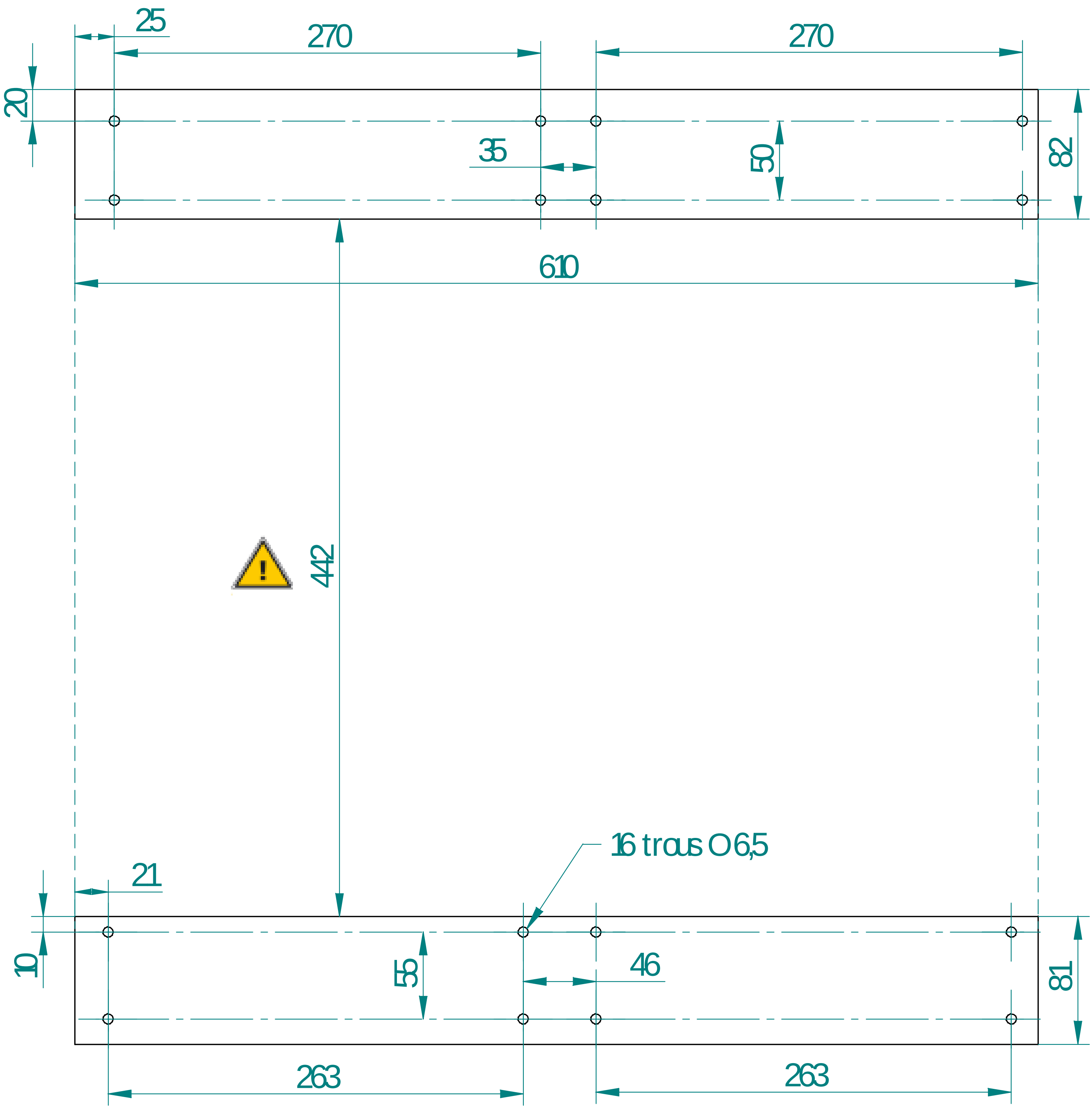
KIT MC 20 to 30



Precise wall installation is required to ensure full efficiency of the humidifier.

continued

KIT MC 40 to 60

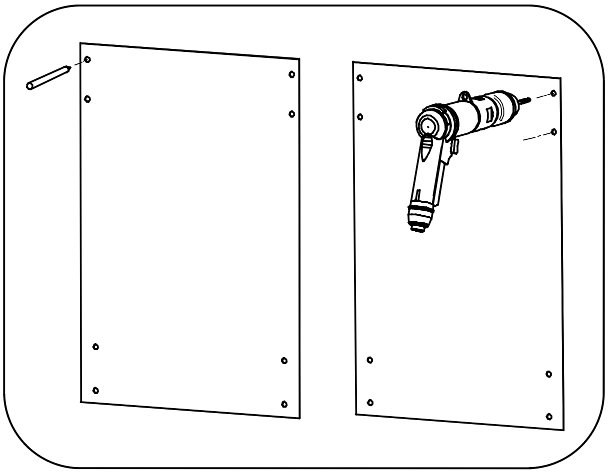


Precise wall installation is required to ensure full efficiency of the humidifier.

Method :

Any loss or damage during delivery should be reported to carrier by registered letter within 3 working days and be advised to **devatec** or to authorized dealer.

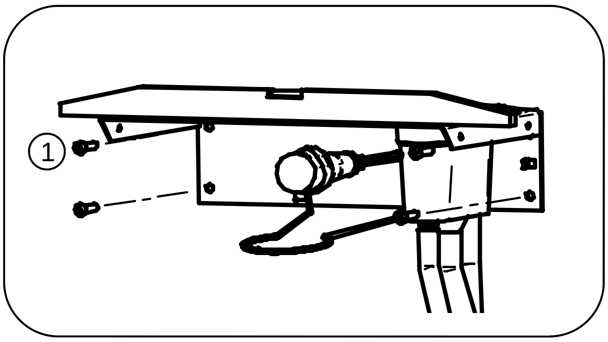
Unpack the humidifier from its carton box, take the steam cylinder off the bracket and lay it gently on ground and attach the humidifier bracket on the the wall as per the following :procedure :



Pick up the supplied drilling template and lay it flat against the wall where the humidifier should be installed paying care of the measures.

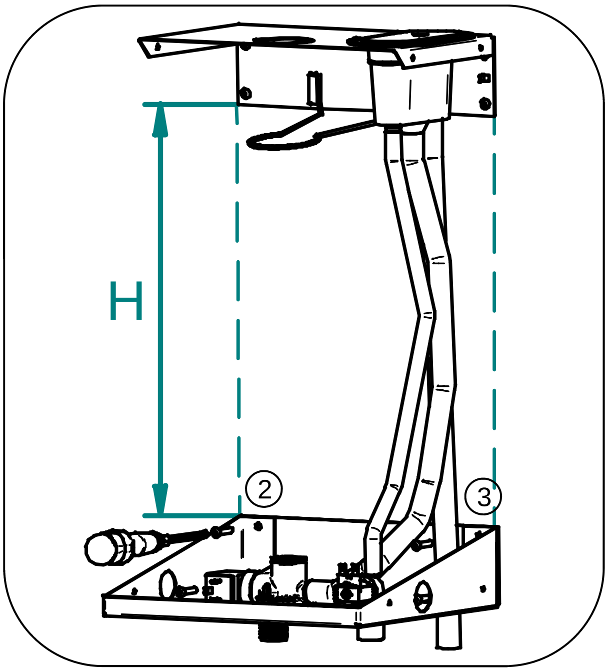
The small KIT MC 5 to 30 requires 8 drilling marks while the large KIT MC 40 to 60 requires 16 drilling marks. For the large kit, mark the first eight drilling marks, trace the template corners and then report the drilling template to the right side aligning the corners. Mark the eight drilling marks anew.

Drill holes at the drilling marks, insert pegs appropriate to the support.



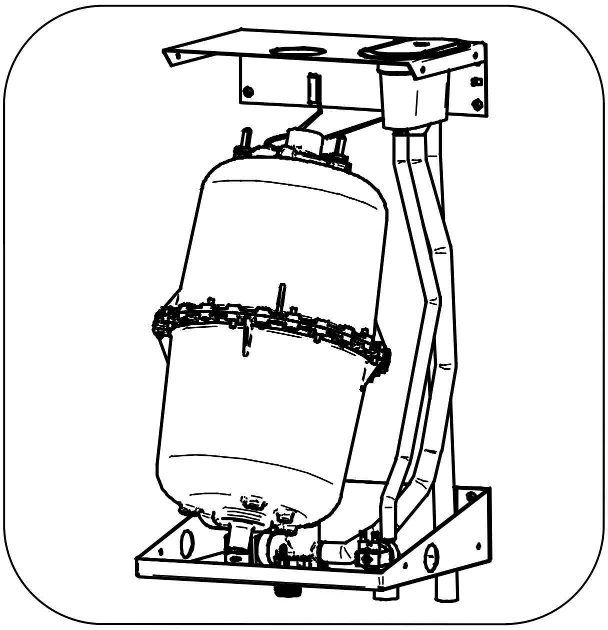
Take the upper bracket and fix it with a screw (as per in 1 on the attached drawing). Level the bracket with a bubble level and screw up the other three screws.

Take care : KIT MC 40 to 60 requires that two upper brackets be wall installed and secured by 8 screws.



Take the lower bracket, install it on wall with screws 2 & 3 as per attached drawing. Control vertical alignment and distance H (s.a. page) and screw up the 4 screws.

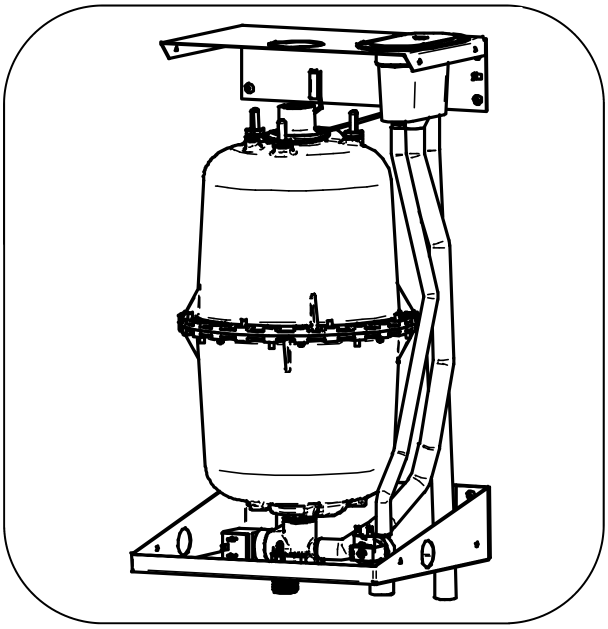
Take care : KIT MC 40 to 60 requires that two lower brackets be wall installed and secured by 8 screws.



Pick up the cylinder, tilt it a little to engage the steam outlet inside the retaining spring.

Lift the cylinder upward, put the drain outlet facing the drain valve body and push downward to fit it into it.

For KIT MC 40 to 60, install the second cylinder the same way.



Make sure that the retaining spring fits correctly the top of the cylinder.

For KIT MC 40 to 60, attach the second retaining spring the same way.

The Installation step is now over.
The unit should now be properly connected to mains, water supply and to steam discharge.

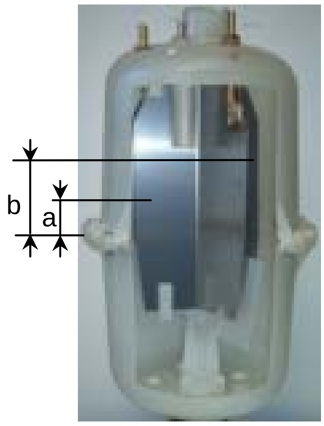
WATER CONNECTION

Recommendations :

The operating principle of the electrode steam humidifier is the electrolyse where an electrical current runs through stainless steel electrode plates immersed in water made conductive by the mineral salts it contains.

The ElectroVap humidifier can produce steam from 3 water qualities having the following characteristics :

The water level must be between « a » and « b » for the maximum capacity of the cylinder.



Town water or raw water : the water TH should be **between 0 and 40° French grade** for a conductivity **between 1000µ and 350µS/cm (Micro Siemens per centimetre).**

Softened water: water treated by sodium/calcium permutation on resins.
The titration value TH should be kept as constant as possible and **between 0° and 2°**.
It is essential that the salt maintenance of softeners be programmed for the water volume consummed in order to prevent an excessive salt concentration to humidifer once the regeneration cycle is finished (please refer to the softener's user manual). Duplex softeners are best suited to your humidifier in this regard. In doubt, please consult **devatec**.

Demineralised water: this is a water treatment by reverse osmosis or running through resins.
The ElectroVap humidifier can work with demineralised waters having a minimum water quality of **30µS/cm**. A tea spoon of bicarbonate of soda must be added on start-up to initiate steam production.

No chemical agent whatsoever (chlorine, disinfectant, ozone…) must be added to the water. Some water qualities may generate foam that can disturb the correct functionning of the humidifier. If this occurs to your humidifier, please refer to devatec for further assistance.

Recommendations on water tapping :

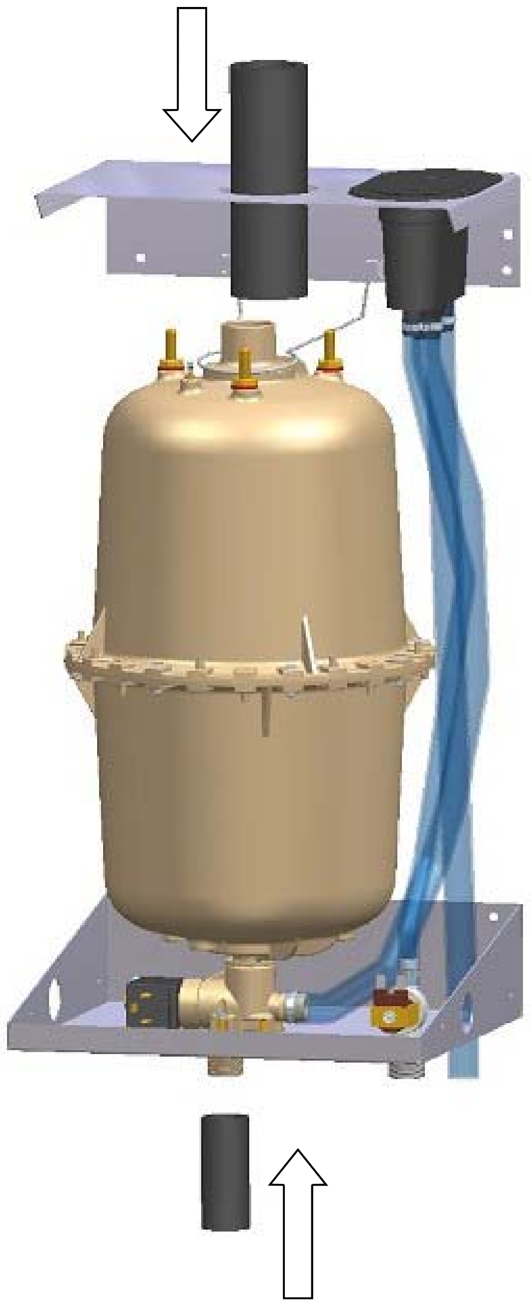
A fresh mains cold water service should be used to supply the unit. The water pressure should not exceed 6 bar and should not be inferior to 1 bar with a temperature less than 40°C.

The water supply connection is on the bottom of the unit. All the KIT MC are supplied with a 500 mm long water inlet hose with a 3/4" female connection to the cold water supply. **A check valve should be located on the mains and cold water service connection to the unit**.

The KIT MC humidifier uses water to produce steam so leakage may happen causing potential damage. If an installation in false ceiling or above prime rooms such as museum, exhibition or laboratory rooms is considered, ensure that the floor below the humidifier is constructed from waterproof materials (with draining facilities) to withstand any water spilling during servicing or if a problem occurs.

Steam ouput

The connection to the steam outlet should be made with a Ø 25 or 40 mm steam hose as per the model of humidifier. To prevent steam leakage, it must be tightened with the supplied clamp.



A Ø 25 mm heat resisting drain hose must be connected to the drain outlet. To prevent any water leakage, the drain hose must be tightened with a collar clamp.

For an easy installation, a water hose kit (part nb 10005902) is available (s.a. page 8) .



RECOMMANDATIONS :



All works concerned with the electrical installation must be carried out by skilled and qualified personnel (eg electrician with appropriate training). The customer is responsible for ensuring their suitability. Please observe local regulations concerning the provision of electrical installations.



Check all electrical terminal screws at commissioning, after 50 hours operation and at every service thereafter.



Take care : the KIT MC electronic components are very sensitive to electrostatic shocks. Appropriate steps must be taken before any operation.

KIT MC steam humidifier in 3 X 380V - 50/60 Hz

KIT MC	Production (KG/St)	In (A)	Imaxi (A)	Pmaxi (KW)	Cylinder size	Steam diameter	Torroidal transformer
5	5	5,7	6,4	4,2	Small	25	Loop
8	8	9,1	10	6,6	Small	25	Straight through
10	10	11,4	12,4	8,2	Small	25	Straight through
15-2	15	17,1	18,4	12,1	Small	25	Straight through
20	20	22,8	24,5	16,1	40 large	40	Straight through
30	30	34,3	36,5	24	40 large	40	Split
40	40	45,7	48,5	31,9	2 x 40 large	40	Straight through
50	50	57,1	60,5	39,8	2 x 40 large	40	Split
60	60	68,5	72,6	47,8	2 x 40 large	40	Split

KIT MC steam humidifier in 3 X 400V - 50/60 Hz

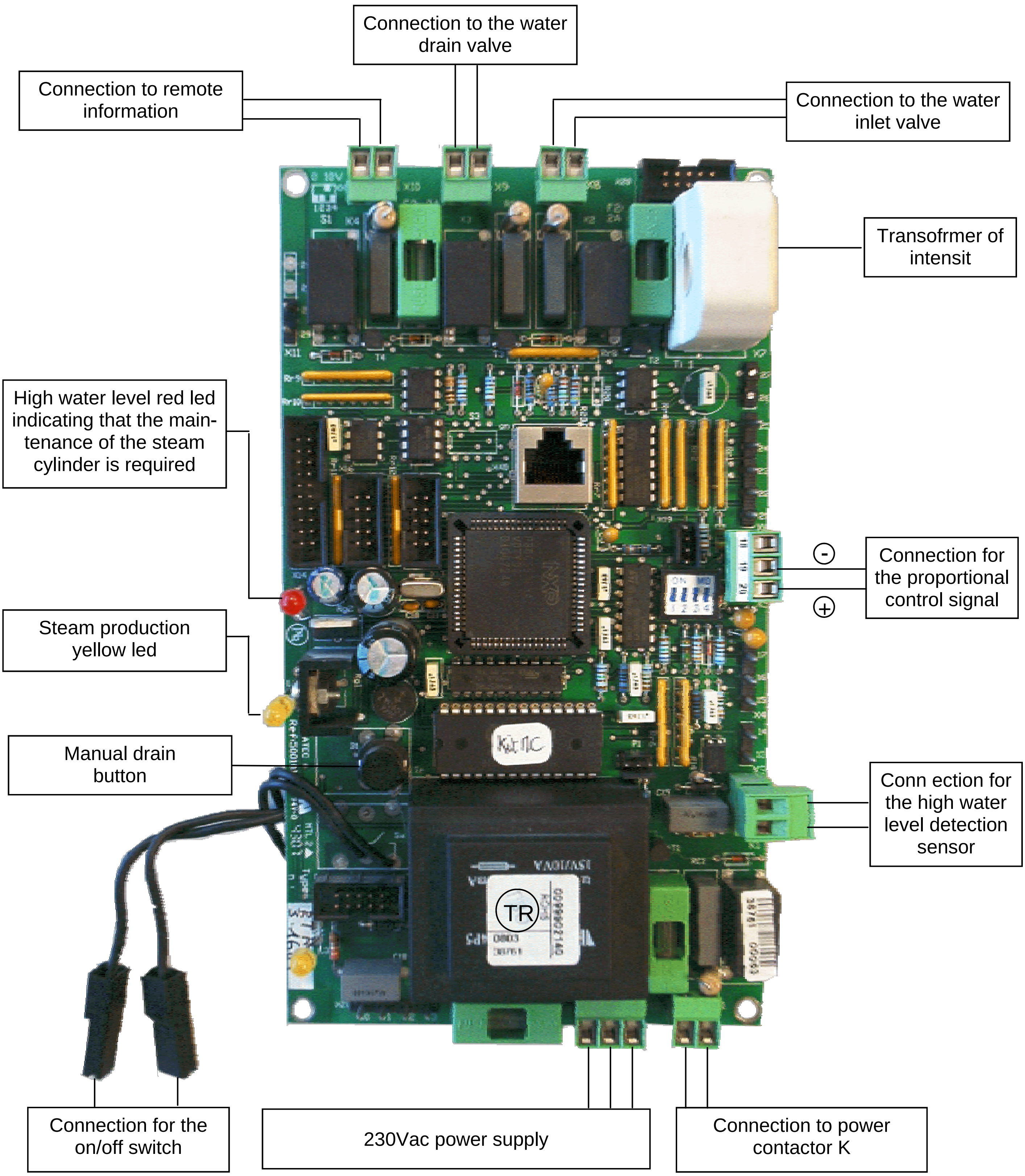
KIT MC	Production (KG/St)	In (A)	Imaxi (A)	Pmaxi (KW)	Cylinder size	Steam diameter	Torroidal transformer
5	5	5,5	6,2	4,24	Small	25	Loop
8	8	8,8	9,7	6,63	Small	25	Straight through
10	10	11	12	8,21	Small	25	Straight through
15-2	15	16,5	17,8	12,18	Small	25	Straight through
20	20	22	23,5	16,07	40 large	40	Straight through
30	30	33	35,1	24,01	40 large	40	Split
40	40	44	46,7	31,94	2 x 40 large	40	Straight through
50	50	55	58,3	39,88	2 x 40 large	40	Split
60	60	66	69,8	47,74	2 x 40 large	40	Split

ALL WORKS CONCERNED WITH ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY A SKILLED AND QUALIFIED PERSONNEL

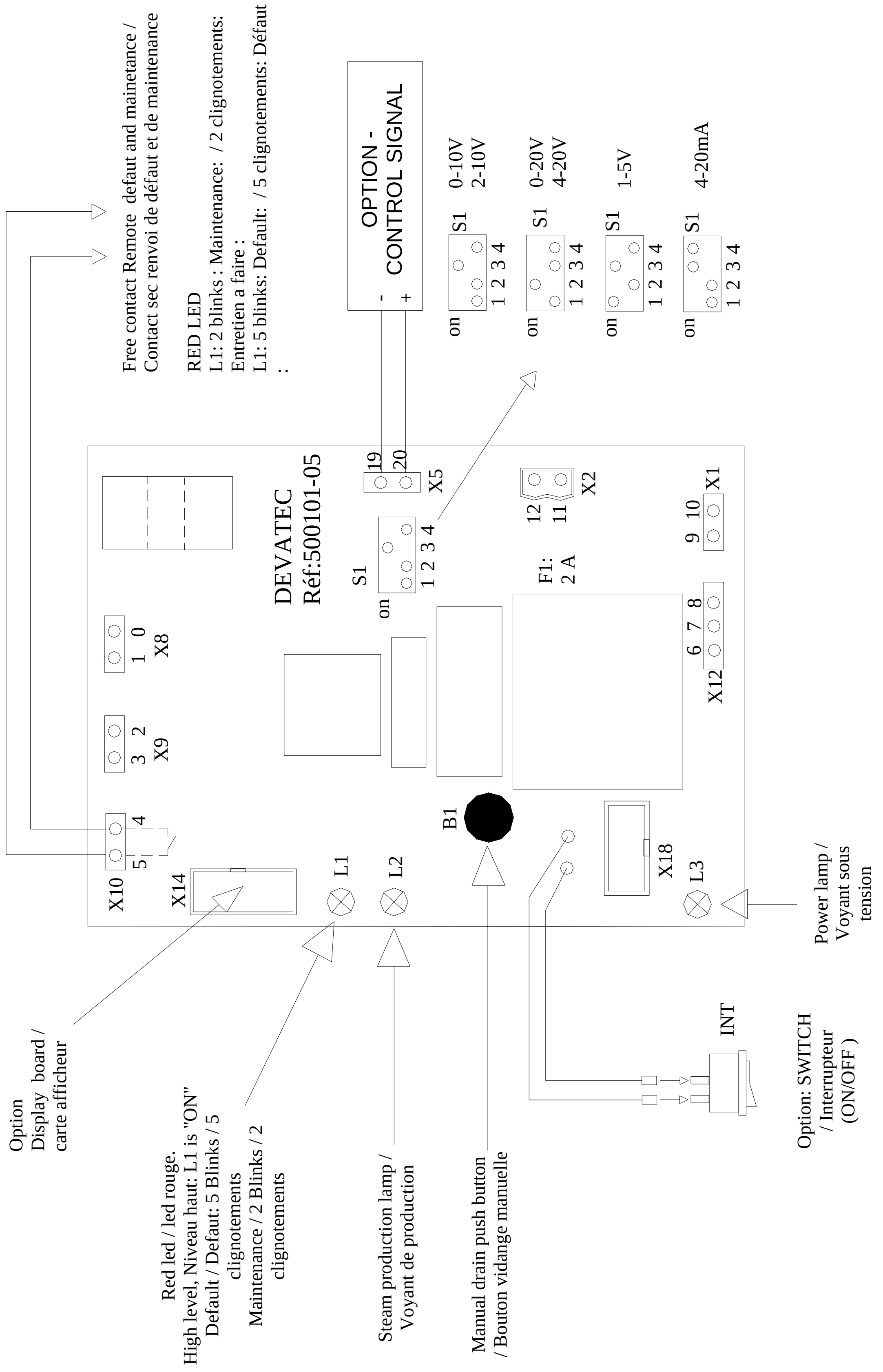
KIT MC steam humidifier in3 X 415V - 50/60 Hz

KIT MC	Production (KG/St)	In (A)	Imaxi (A)	Pmaxi (KW)	Cylinder size	Steam diameter	Torroidal transformer
5	5	5,3	6	4,26	Small	25	Loop
8	8	8,5	9,3	6,60	Small	25	Straight through
10	10	10,6	11,6	8,23	Small	25	Straight through
15-2	15	15,9	17,1	12,14	Small	25	Straight through
20	20	21,2	22,7	16,11	40 large	40	Straight through
30	30	31,8	33,9	24,06	40 large	40	Split
40	40	42,4	45	31,93	2 x 40 large	40	Straight through
50	50	53	56,2	39,88	2 x 40 large	40	Split
60	60	63,6	67,3	47,76	2 x 40 large	40	Split

Functions of the main circuit board (500101/05)



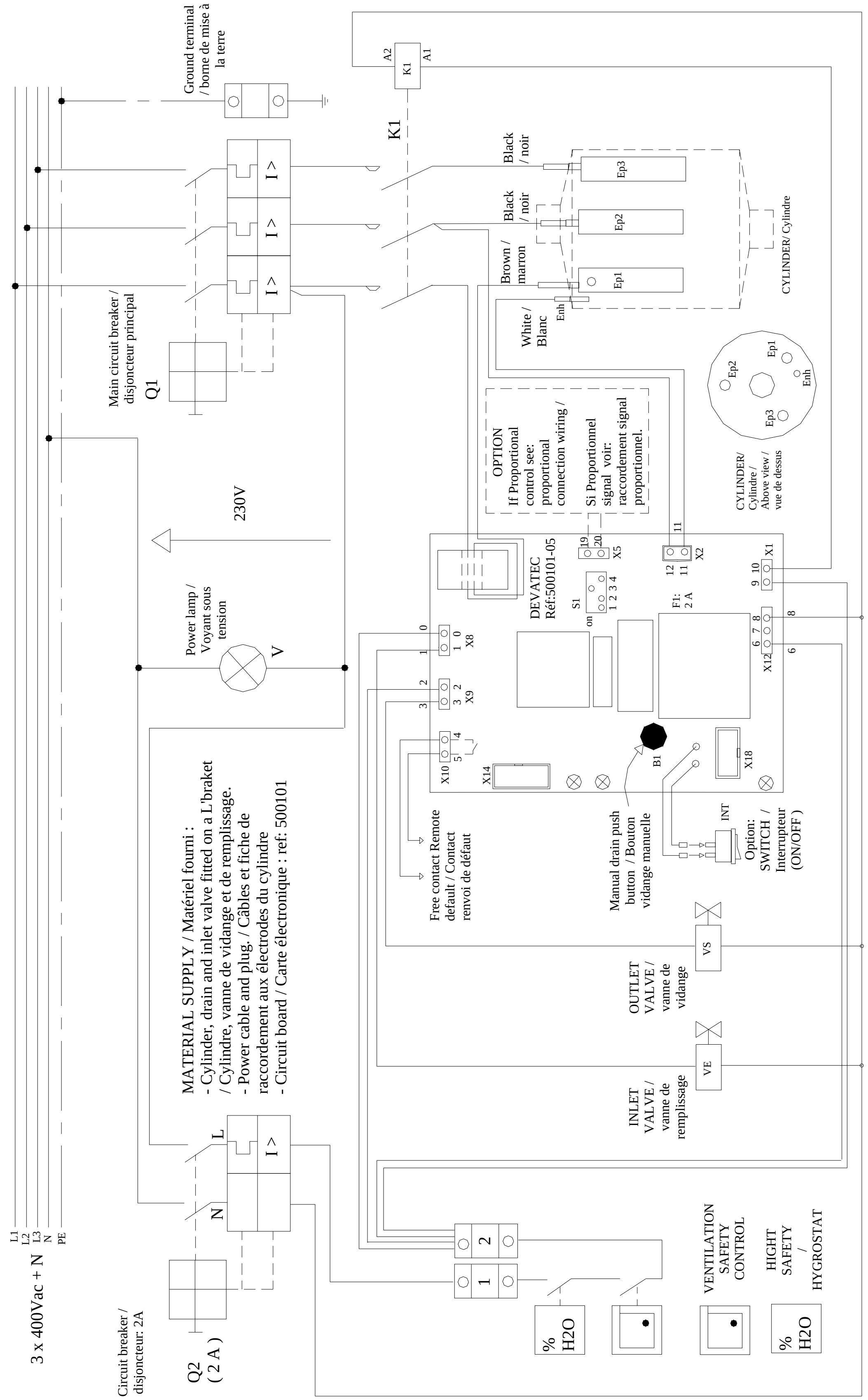
Proportional control and remote information board wiring scheme



ELECTROVAP KIT MC

Installation - Step 3

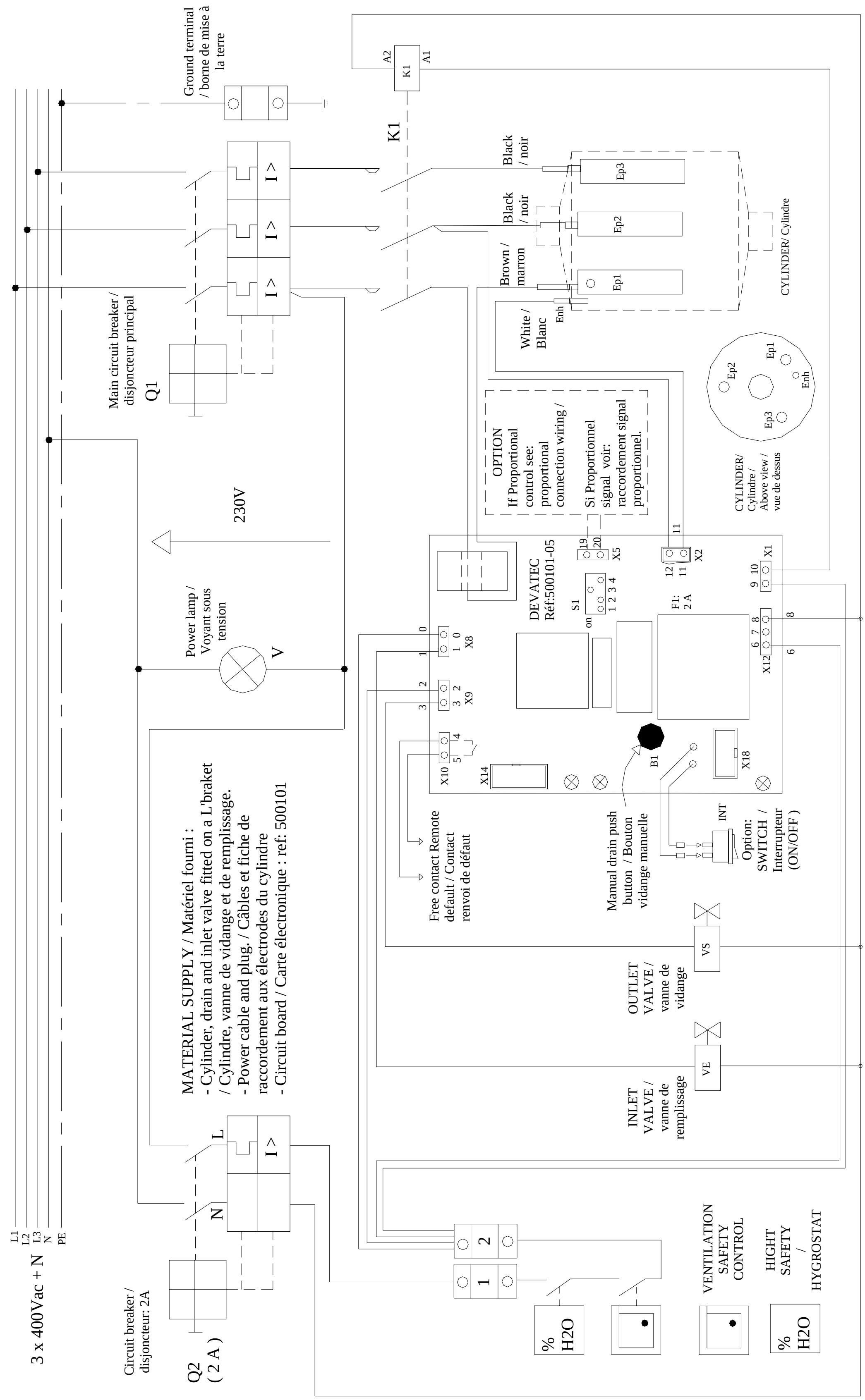
KIT MC2 5 wiring scheme - 3x380-400-415V + N



ELECTROVAP KIT MC

Installation - Step 3

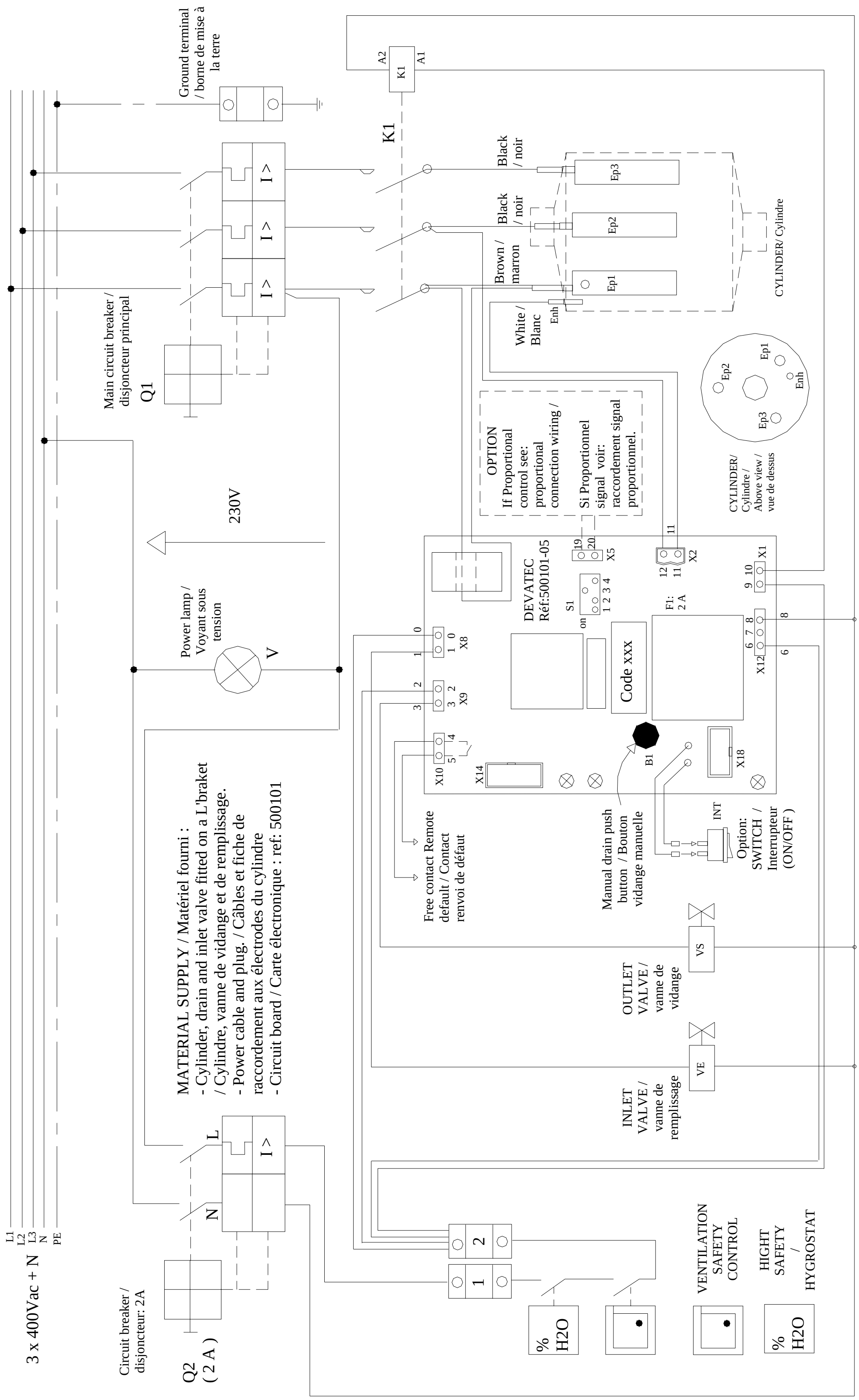
KIT MC2 8 to 20 wiring scheme - 3x380-400-415V + N



ELECTROVAP KIT MC

Installation - Step 3

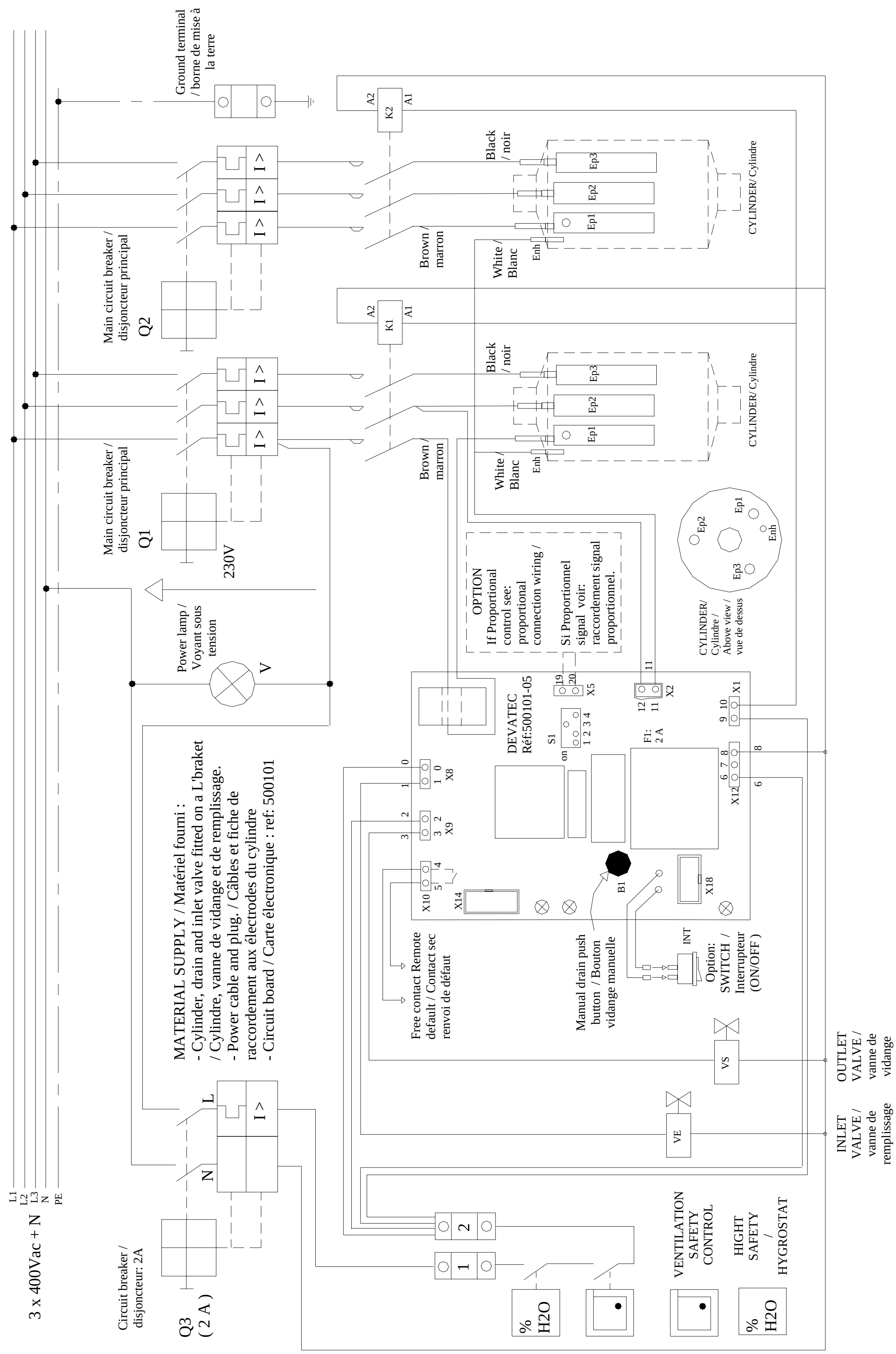
KIT MC2 30 wiring scheme - 3x380-400-415V + N



ELECTROVAP KIT MC

Installation - Step 3

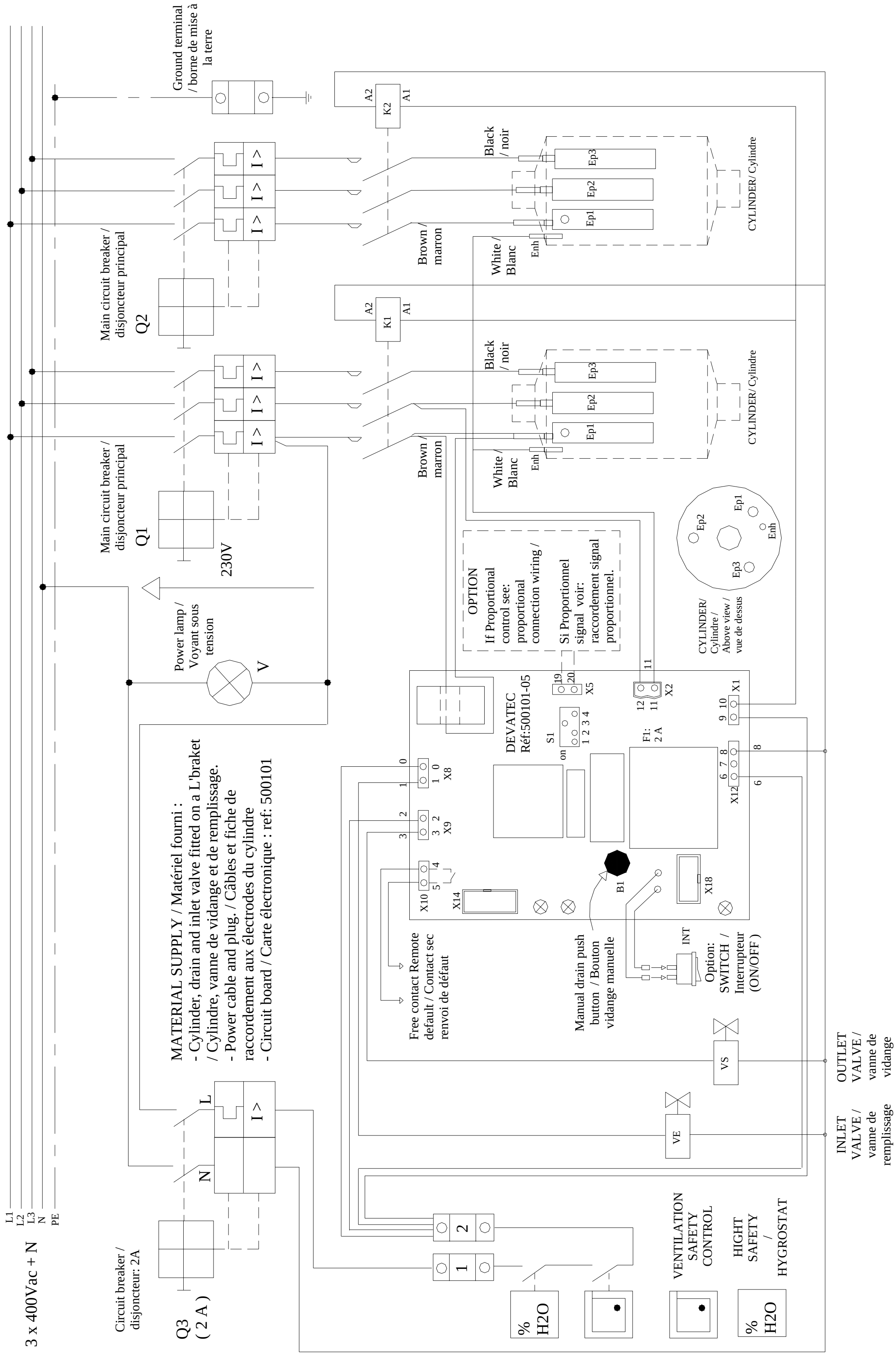
KIT MC2 40 wiring scheme - 3x380-400-415V + N



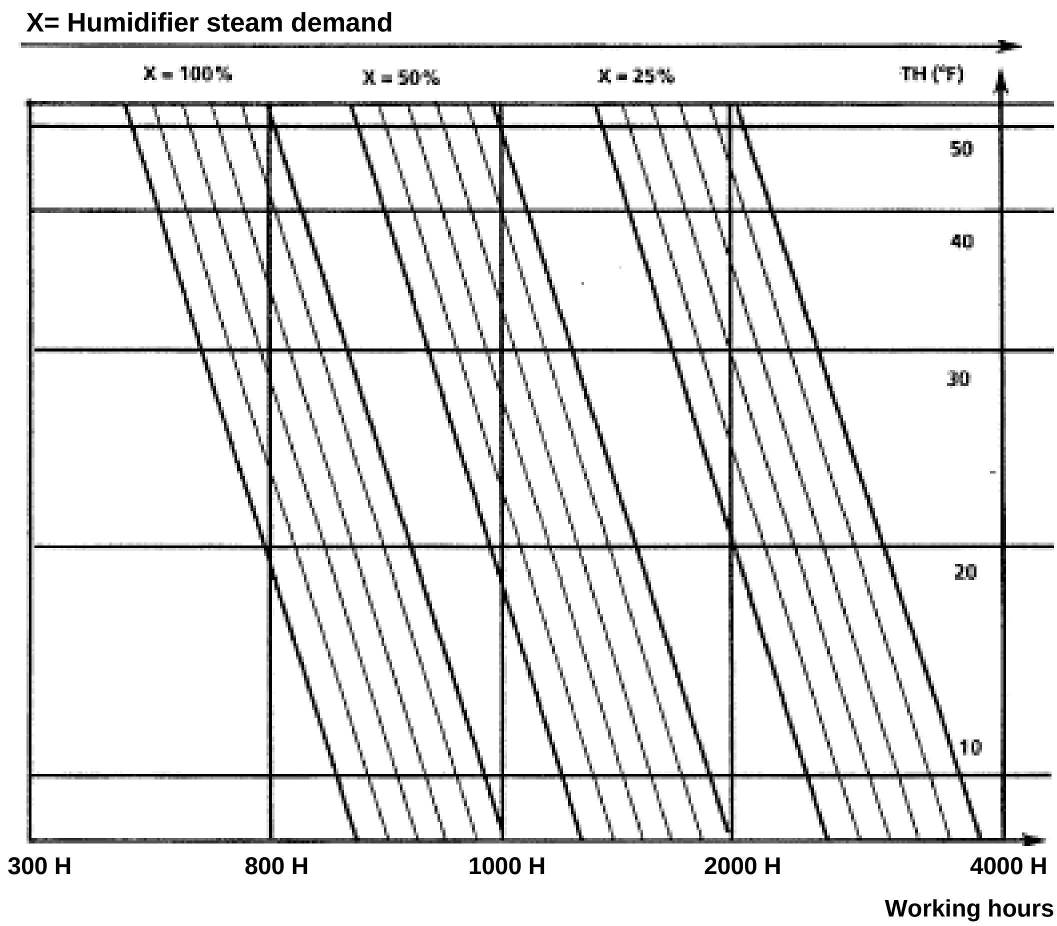
ELECTROVAP KIT MC

Installation - Step 3

KIT MC2 50-60 wiring scheme - 3x380-400-415V + N



Estimated cylinder maintenance curve



Example given: it is recommended to maintain (if cleanable type) or change (if disposable type) the steam cylinder every 800 to 900 hours of operation for a humidifier running at full capacity and using a water of TH20.

- The water tightness is indicated in French grade, the said value is the water hydrotimetric content (TH).
- The water quality is to be mentioned on your request so that to fit the most appropriate steam cylinder for the best working of the humidifier.

Length of the genuine stainless steel electrode plates

Model	KIT MC 5 to 15-2	KIT MC 20 to 60
Lenth (mm)	160	250

During cylinder maintenance (page n° 29), it is recommended to measure the length of the electrode plates. The latter should be replaced when the lenght is shorter than 1/3 or 1/2 of the original lenght (s.a. above table).

ELECTROVAP KIT MC
Maintenance - Cleaning of steam cylinder

1.


2.


3.


4.


The KIT MC humidifiers are currently fitted with disposable cylinder(s).The latter can however be easily substitued for cleanable type at customer's choice.

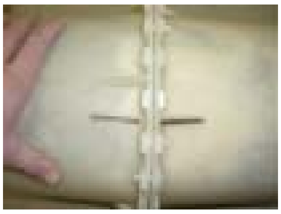
REPLACING THE STEAM CYLINDER

Drain the steam cylinder(s) fully using the manual drain key.
When the cylinder(s) is/are drained fully (a « DRAINING CYCLE OVER » will appear on the display). Isolate the power both at the general switchboard and at the humidifier (rocker power switch).

The steam cylinder(s) may be very hot. Allow it/them to cool down before removing.

Remove the front panel from the humidifer to access the cylinder compartment. Remove power and high water level electrode cables from top of the cylinder(s) (picture 1).
Disconnect the steam hose(s) from the top of the cylinder(s) (pict. 2).

Lift the cylinder upwards until it is clear off the drain valve. Ensure that the gasket remains in the drain valve (picture 3).
Release the top of the cylinder from the retaining clip and pull out the cylinder (picture 4).
The disposable cylinder(s) will be merely replaced by new ones either disposable or cleanable.
Retighten gently the steam hose on the cylinder outlet when the cylinder has cooled down only to prevent deformation.
.



5.



6.



7.



8.



9.

CLEANING THE CLEANABLE STEAM CYLINDER

This method is intended for use with the cleanable cylinder only.

- Mark the edge of the cylinder halves so that they can be matched up when reassembled (picture 5).
  Remove the maintaining nuts and bolts, split the cylinder halves and remove the gasket and the strainer that must be cleaned(pict 6).
- Scrap mineral deposits off the electrode plates and the shells (a weak descaling solution can also be used) (pictures 7, 8 & 9).
- Rince the electrodes, the cylinder shells and the divider. It is important that the strainer at the cylinder bottom be also cleaned.

Take care : never chock the shell rims to get rid of the deposits

Relocate the strainer into the cylinder bottom. **Replace the cylinder gasket**, and fit it inside the groove of the lower shell and attach the upper shell with the electrodes .

When re-assembling, take care to align both shells. Refit the bolts and nuts. Retigthen them gently (when the cylinder is still cold). Rinse the drain valve 'o' ring and grease it or replace it if needed.

Important

At this stage, the drain valve must be maintained.

NB : Refit the cylinder to the humidifier once the drain valve is maintained.

ENTRETIEN DE LA VANNE DE VIDANGE

The drain valve should be maintained whenever the steam cylinder is maintained or changed.



Once the steam cylinder has been pulled out (please refer to the « cleaning of the steam cylinder » page), disconnect the drain valve supply wires.



Unscrew the solenoid retaining nut and remove the washer. Put them on the cylinder compartment tray.



Remove the coil from the valve stem.



Unscrew and remove the valve stem and the filling hose from the valve body.

Important : Apply some soap on the O-ring and the cylinder draining outlet



Remove the « O » ring and the drain valve collar. Remove any pieces of calcius, rinse the steam and the body with fresh water.

Assemble in reverse order.

It is now time to locate the new or cleaned steam cylinder in its compartment in proceeding this way : set the maintaining clip on the steam cylinder outlet, engage the drain outlet into the drain valve and push the cylinder downward. Reconnect the power cables. Make sure that the power cable with the brown identification mark be connected to the cylinder connection identified with a brown spot. If the brown spot is missing, the cylinder electrode connection can be identified as the one closest to the high water level probe. Locate the steam hose and fasten the clamp.

Ensure that all the clamps are properly tightened whenever the humidifier is maintained.

INLET VALVE MAINTENANCE

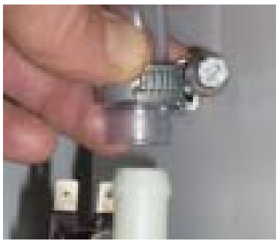
⚠ The inlet valve should be maintained every 6 months as a minimum and after 50 hours operation.



Isolate the water supply and remove the water supply hose from the valve.



Disconnect the electrical wires from the coil.



Untighten the collar clamp and remove the water feed hose.

Unscrew the black nut (1) and lay it on the cylinder compartment tray.



Take the valve out and remove the basket filter from the base of the valve with a pair of long nose pliers. Pull the coil out with a flat screw driver.



Wash the basket filter under clean water to remove any dirt and debris.

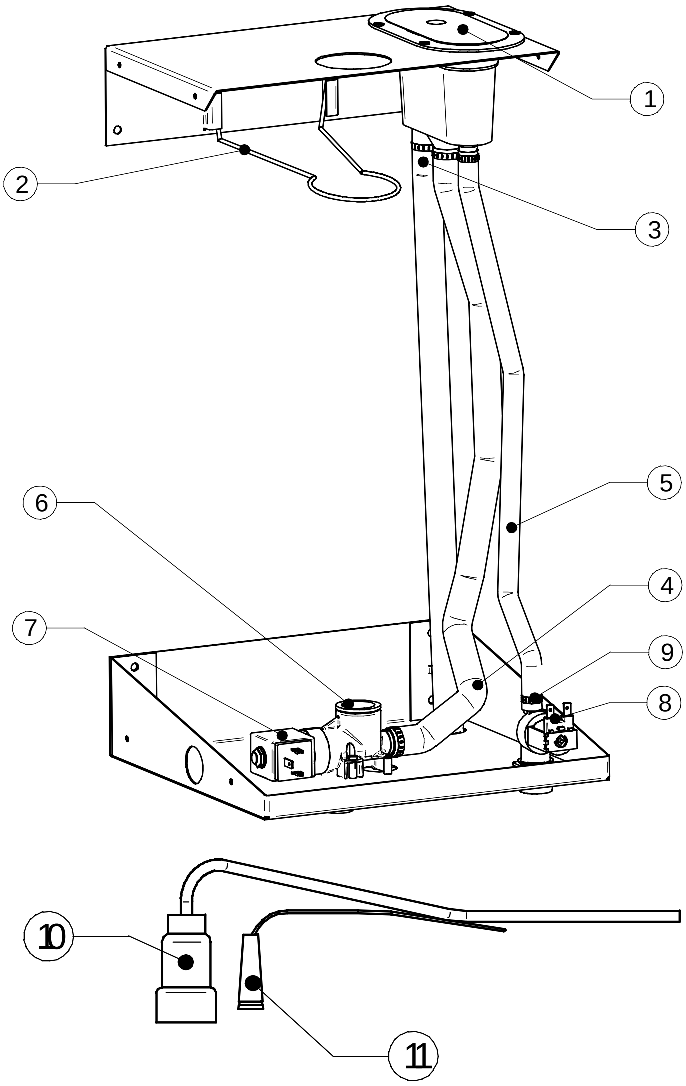
Replace whole valve if cleaning is not practical or replace coil if necessary.

Assemble in reverse order taking care to replace collar clamp if necessary.

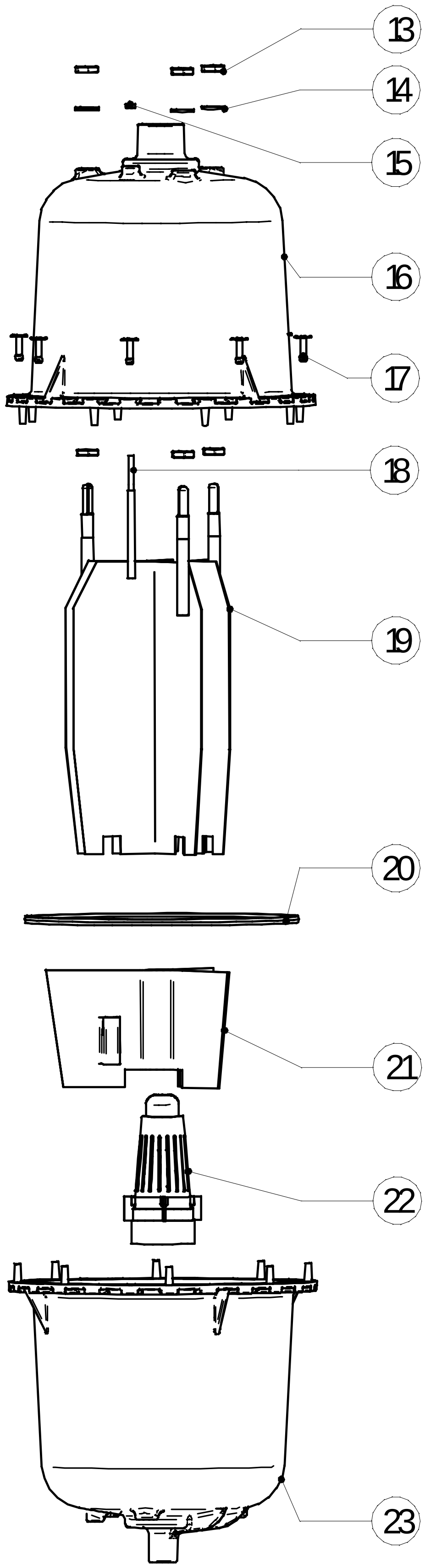
Ensure that everything is correctly assembled and switch the humidifier on.

⚠ Ensure that all the clamps are properly tightened whenever the humidifier is maintained.

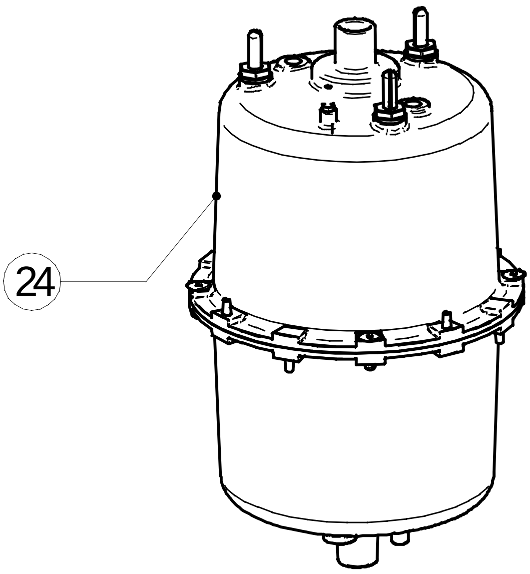
Rep	Code	Description
1	930058 930059 930060	Filling cup with hoses for KIT MC 5 to 15-2 Filling cup with hoses for KIT MC 20 to 30 Filling cup with hoses for KIT MC 40 to 60
2	930080	Cylinder retaining clip for KIT MC cylinder
3	930136	Overflow hose Ø18/22mm (per meter)
4	930136	Water feed hose Ø18/22mm (per meter)
5	930135	Water feed hose Ø12/16mm (per meter)
6	930189	Bag of 10 drain valve 0-rings
7	930153 930307 930220 930161	230V complete drain valve Plastic drain valve body Drain valve stem with 230V solenoid 230V solenoid
8	930150 930151 930160	Inlet valve KIT MC 5 to 15-2 Inlet valve KIT MC 20 to 60 230V inlet valve solenoid
9	930081 930082 930083 930301 930302	Hose clamp Ø12x22mm Hose clamp Ø16x27mm Hose clamp Ø20x32mm Hose clamp Ø25x40mm Hose clamp Ø40x60mm
10	930085 930086	Power cable kit n° 1 (3 single cables with sockets and boots) Power cable kit n°2 (2 single cables + 1 split cable with sockets and boots)
11	930088 930089	High water level electrode cable for KIT MC 5 to 15-2 High water level electrode cable for KIT MC 20 to 60

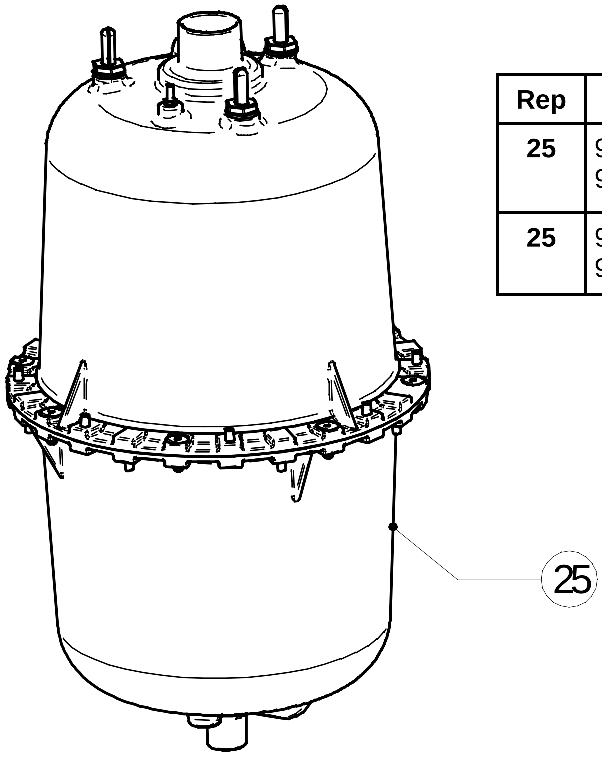


Rep	Code	Description
13	930190	Brass nut Ø 8mm
14	930301	Bag of 3 fibre washers
15+ 18	930211	High water level electrode + nut Ø 4mm
16		Cylinder upper half—Please consult factory
17	930203 930223	Bag of bolts & nuts KIT MC 5 to 15-2 (cleanable cylinder) Bag of bolts & nuts KIT MC 20 to 60 (cleanable cylinder)
19	930165 930158	Cylinder maintenance kit MC 5 to 15-2 Cylinder maintenace kit MC 20 to 90
20	930162 930166	Cylinder gasket KIT MC 5 to 15-2 Cylinder gasket KIT MC 20 to 60
21	930169	Electrode plate divider KIT MC 20 to 60
22	930168 930159	Cylinder strainer KIT MC 5 to 15-2 Cylinder strainer KIT MC 20 to 60
23		Cylinder lower half—please consult factory



Rep	Code	Description
24	930010 930020	Disposable cylinder KIT MC 5 to 15-2 EA disposable KIT MC 5 to15-2
24	930028 930037	Cleanable cylinder KIT MC 5 to 15-2 EA cleanable cylinder KIT MC 5 to 15-2





Rep	Code	Description
25	930014 930023	Disposable cylinder KIT MC 20 to 60 EA disposable cyklinder KIT MC 20to 60
25	930032 930040	Cleanable cylinder KIT MC 20 to 60 EA cleanable cylinder KIT MC 20 to 60

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Kit MC Rev 4 - 29.06.11 edition